THE STATUS OF TRUMPETER SWANS IN BRITISH COLUMBIA AND YUKON, SUMMER, 1985

R. McKelvey

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ABSTRACT

A survey was conducted in July and August 1985 to determine the status of Trumpeter Swans breeding in British Columbia and Yukon. A total of 185 adults (white birds) and 53 cygnets were recorded. All areas except the Ft. St. John area had fewer swans than in previous years. Possible causes of those changes are discussed. The most likely reason for the decline noted is high mortality on the wintering area near Yellowstone National Park, U.S.A.

RÉSUMÉ

Un inventaire a été effectue en juillet et en août 1985 pour déterminer le status des Cygnes Trompettes nichant en Colombie Britanique et au Yukon. Un total de 185 adultes (oiseaux blancs) et de 53 cygnets fut dénombré. Tous les endroits à l'exception de la région de Fort St. John avaient moins de cygnes que les années précédentes. Les causes possibles de ce changement sont discutées. La cause la plus plausible de ce déclin est une mortalité élevée sur les aires d'hivernage près du Parc National de Yellowstone, aux Etats Unis.

TABLE OF CONTENTS

ABSTRACT	i
RESUME	i
LIST OF TABLES	iii
INTRODUCTION	1
METHODS	1
RESULTS AND DISCUSSION	7
Population Status	7
Yukon	7
British Columbia	12
Habitat Conditions	12
Yukon	12
British Columbia	15
CONCLUSIONS	15
ACKNOWLEDGEMENTS	16
LITERATURE CITED	17
APPENDICES	
1. Maps of Survey Areas	18
2. Sighting Locations	22
3. Data Summary for Future Comparisons	29

LIST OF TABLES

Table 1. Approximate route flown during the 1985 Trumpeter Swan survey, Yukon Territory. 2

Table 2. Approximate route flown during the 1985 Trumpeter Swan survey, British Columbia. 5

Table 3. Summary of observations of Trumpeter Swans in the Yukon and British Columbia, July 1985. 8

Table 4. Structure of the swan population in the Toobally Lakes area, 1980, 1981 and 1985. 10

Table 5. Locations of swan sightings in the Ft. Nelson area, 1981 and 1985. 13

INTRODUCTION

An investigation of the status of Trumpeter Swans (Cygnus buccinator) breeding in Yukon was completed in 1981 and reported in the literature in 1983 (McKelvey et al. 1983). The status of Trumpeter Swans breeding in British Columbia has never been published, although several unpublished reports have documented population size in known breeing areas (McKelvey 1981a and 1981b; Turner 1982; CWS Swan Sighting File [McKelvey in prep.]). Population data have been gathered more systematically in Alberta (Turner 1982) and in Alaska (King and Conant 1981).

The U.S. Fish and Wildlife Service has been conducting Alaska-wide surveys of Trumpeter Swan populations at five year intervals. In 1985 the Canadian Wildlife Service agreed to conduct a survey of Trumpeter Swans breeding in Canada to coincide with the Alaska survey. The primary objective of that coordinated survey, which included counts of refuge flocks and reintroduced wild flocks, was to determine the range wide (world) status of the Trumpeter Swan.

This report contains the results of the survey in Yukon and British Columbia. Included are details of the survey routes, the population status in known breeding areas, and a subjective assessment of habitat conditions.

METHODS

The survey routes and the flight dates, for the Yukon and British Columbia portions of the survey, are shown in Tables 1 and 2, respectively. Maps showing the general location of the survey routes are presented in Appendix 1. Locations of place names mentioned in Tables 1 and 2 can be found on National Topographic System (NTS) 1:250,000 maps for British Columbia and Yukon. The routes flown were based on the locations of past observations,

Table 1. Approximate route flown during the 1985 Trumpeter Swan survey, Yukon Territory.

Date	Location	Notes
27 July	Teslin	survey departure point
	Nisutlin Bay	
	Morley Bay	
	Lakes west of Morley River	60 03 N x 132 20 W
	Morley Lake	
	Swift Lake	
	Kachook Creek	near Mt. Charlie Cole
	Zacudo Lake	
	Hutsigola Lake	
	Lakes near Hayes River	59 31 N x 132 12 W
	Lakes near Goodwin Creek	59 40 N x 132 13 W
	Hall Lake	
	Gladys River	
	Gladys Lake	
	Airplane Lake	
	Happy Valley	
	Tarfu Lake	
	Snafu Creek	
	Snafu Lake	
	Teenah Lake	
	Little Atlin Lake	at narrows
	Tagish Narrows	
	Lakes west of Marsh Lake	60 21 N x 134 19 W
	Marshes west of M'Clintock River	60 34 N x 132 35 W
	M'Clintock River	
	M'Clintock Lake	turned north
	Baker Lake	
	Rosy Lake	
	Sidney Creek	
	Quiet Lake	
	Big Salmon Lake	
	Nisutlin River	
	Nisutlin Lake	via river
	Red River Lake	
	Lakes near Red River	60 55 N x 132 46 W
	Nisutlin River	
	Teslin	survey end
	Distance flown 600km; flying time 4.8 hrs.	
28 July	Teslin	survey departure point
	Wolfe River	
	Trout Creek	
	Red River	
	Nisutlin Lake	
	Moss Lake	
	McNeil River	

Table 1. continued

Date	Location	Notes
28 July	Weasel Lake	
	Bruce Lake	
	Ross River	stopped for fuel
	Olgie Lake	
	Orchay Lakes	
	Lower Tay Lake	62 12 N x 132 13 W
	Upper Tay Lake	
	Lewis, Field, Sheldon Lakes	
	North Sheldon Lakes	62 47 N x 131 12 W
	Fuller Lake	
	Wilson Lake	
	Itsi Lakes	
	John Lake	
	Otter Lake	
	Pelly River	
	Fortin Lake	
	Finlayson Lake	
	Lower McEvoy Lake	61 42 N x 130 24 W
	McEvoy Lake	
	Upper McEvoy Lake	61 50 N x 130 05 W
	McPherson Lake	
	Tillei Lake	
	East Frances Lake	east arm
	Leckie lakes	
	Tuchitua River and Lakes	
	Little Jimmy Lake	
	Twin Lakes	
	Airplane Lake	
	Dodo Lakes	
	Watson Lake	survey end
	Distance flown 1100 km; flying time 7.8hrs.	
29 July	Watson Lake	survey departure point
	Garden Creek	
	Baker Lake	
	Contact Creek	
	Coal River	
	Lootz Lake	
	Spruce Creek	
	North Toobally Lake	
	Jackpine Lake	
	Spruce Lake	
	Balsam Lake	
	Caribou River	

Table 1. concluded

Date	Location	Notes
	Rock River	
	Coal River	
	Quartz Lake	
	Tom Lake	
	Watson Lake	stopped for fuel
	McKinney Lake	
	Egnell Lakes	
	Tsia Lakes	
	Hillgren Lakes	
	Shaw Creek	
	Triangle Lakes	
	Crooked Lake	
	Tropical Creek	
	Thorpe Creek	
	Larson Lake	
	Crow Lakes	60 13 N x 125 52 W
	Lakes east of Toobally Lakes	60 14 N x 126 10 W
	Turquoise Lakes	60 12 N x 126 32 W
	Siwash Creek	
	Triangle Lake	
	Barney Lake	
	Watson Lake	survey end; aircraft returned to Teslin base

Distance flown 900 km; flying time 6.3 hrs.

Table 2. Route flown during the 1985 Trumpeter Swan survey, British Columbia.

Date	Location	Notes
3 August	Fort Nelson	survey departure point
	Clarke Lake	
	Ellen Creek	
	Klua Lakes	
	Tommy Lakes	
	Prophet River	
	Tenaka Creek	
	Klowee lake	
	Tsea Lakes	
	Komie Lake	
	Fort Nelson	survey end
	Distance flown 500 km; flying time 3.3 hrs.	
5 August	Ft. St. John	survey departure point
	Boudreau Lakes	
	Moberly Lake	
	Big Lake	
	Jackfish Lake	
	Wasp Lake	
	Muskeg Lake	
	Bearhole Lake	
	Blackhawk Lake	
	Tent Lake	
	One Island Lake	
	Beaverlodge Lake	
	Klukas Lake	
	Boundary Lake	
	Cecil Lake	
	Ft. St. John	survey end
	Distance flown 650 km; flying time 3.7 hrs.	

generally including habitats known to have supported Trumpeter Swans. Because of the large areas involved and the dispersed nature of previous records, a systematic search pattern could not economically be employed. Therefore no nesting habitats that might potentially support swans were surveyed that had not been visited before.

For the Yukon survey a float equipped Maul M7 aircraft was used, and for both parts of the British Columbia survey wheel equipped Cessna 206's were employed. Additional information and counts in southeastern Yukon were obtained, in conjunction with other work, from a Bell 206 Jet Ranger. The surveys were flown at altitudes of 150 to 300m above ground level, at cruising speeds. When necessary, lower altitudes and slower speeds were used, and broods were often circled to gain accurate counts of the young. All observations were recorded on tape and the location of each observation noted on NTS 1:250,000 maps. For the Crow River and Jackpine Lakes area in Yukon locations were noted on NTS 1:50,000 scale maps and for the Siwash Creek area locations were noted on tracings of aerial photographs (see Appendix 1 for general locations). The latitude and longitude of all observations were later determined from the mapsheets and entered as individual records in the CWS Swan Sighting File (McKelvey in prep.).

Observations of habitat conditions were made for most wetlands visited. Apparent changes in water level, marsh conditions (i.e. abundance of plant growth) and changes since previous surveys in surrounding forest cover were noted. The presence or absence of beaver (Castor canadensis), and their impact on the wetlands, was also recorded.

In addition to data from surveys scheduled explicitly to search for Trumpeter Swans, some information was also obtained from other sources. Those included a waterfowl reconnaissance survey in the Beaver Creek area (M. Dennington, C.W.S. Whitehorse, pers. comm.); a habitat reconnaissance near

Stoney Lake (B. Churchill, B.C. Wildlife Branch, Ft. St. John, pers. comm.); observations by Conservation Officers in Terrace, and Smithers, B.C.; and observations from B. Conant, U.S. Fish and Wildlife Service, Juneau.

RESULTS AND DISCUSSION

Population Status

The results of the aerial surveys in Yukon and British Columbia are summarized in Table 3. Details of the locations and nature of each sighting are given in Appendix 2.

Yukon. The Teslin portion of the survey revealed fewer birds than was expected. Although that area has never been covered before in one comprehensive survey, swans have been seen there during the course of other studies. Big Salmon River, Teenah Lake and Hutsigola Lake, which had previously been occupied by swans, were unoccupied during this survey. More swan sightings were expected than were made in previous surveys. The area south of Teslin Lake appears to be on the route taken through northern British Columbia and southern Yukon by swans on spring migration to Alaska (McKelvey and Burtor 1983). The Alaska population of Trumpeter Swans is rapidly increasing (Conant 1984) and might therefore be expected to pioneer into new territory. Either the Teslin Lake area does not contain particularly good breeding haitat for swans, or the Alaska population has not yet reached a stage where it is colonizing southward.

The Ross River/McEvoy Lake area also showed fewer swans than expected. Swans were seen in the McEvoy Lake/McPherson Lake area but they were not seen near Ross River or in the Sheldon Lakes area, both of which areas had supported swans in the past (M. Dennington, pers. comm.). Again, those areas appear to have good potential swan habitat, but the bulk of it is currently unused.

Table 3. Summary of observations of Trumpeter Swans in Yukon and British Columbia, July 1985.

Location	Count				
	Flocks	Singles	Pairs	Broods	Cygnets
Teslin		3	1		
Ross/McEvoy	1(4)[2]	3	7	3	8
Toobally		7	27	5	12
Other Areas	4(23)	3	3	1	2
Yukon Total	5(27)	16	38	9	22
Ft. Nelson			8	3	4
Ft. St. John	2(8)	3	16	7	23
Other Areas		1	3	1	4
B.C. Total	2(8)	4	27	11	31
Survey Total	7(35)	20	65	20	53

1 Number in brackets is the number of birds seen in flocks.

I believe that swans in the Ross River to McPherson Lake area are part of the Interior Subpopulation (North American Trumpeter Swan Management Plan [NATSMP], Anonymous 1985). That group is occasionally subject to high winter mortality due in part to habitat limitations on the main wintering area near Yellowstone National Park, Wyoming (NATSMP). Factors that affect the population elsewhere than on the breeding grounds seem the most likely reasons for a lack of birds in an otherwise apparently suitable area.

The Toobally Lakes area also had fewer birds in total than in the past. However, the Jackpine Lake area, the Larsen Lake area and the Crow River area had more birds, while the Triangle Lakes area, Siwash Creek system and Toobally Lakes had fewer birds. For comparative purposes data from this survey have been presented with data from McKelvey et al. (1983) in Table 4. Although I consider the Toobally Lakes area to include contiguous parts of British Columbia, data from those areas have not been used in Table 4. Northern British Columbia was not surveyed consistantly in 1980 or 1981, so comparable data does not exist. For future comparisons however, a modified version of Table 4 has been presented in Appendix 3, which incorporates all data collected in 1985 for the greater Toobally Lakes area.

From Table 4 it appears that the swan population in southeastern Yukon has declined, with lowered productivity, from earlier in the decade. Several factors may have contributed. Those include possible habitat changes caused by a very large forest fire west of Toobally Lakes in 1982, an unusually cold spring and early summer in 1985, and recent harsh winters in the wintering area near Yellowstone National Park. Because of the generally lower number of white birds present in 1985 however, adverse winter conditions seem the most likely cause of the decrease. The late spring in 1985 could have caused a lower rate of production that year, but the lack of adult birds is more likely related to problems elsewhere on the range. Winter conditions have been

Table 4. Structure of the swan population in the Toobally Lakes area, 1980, 1981 and 1985.

	Date		
	1980[1]	1981[1]	1985
Pairs	25	32	21
Nests	14	12	ND[2]
Broods	6	10	4
Mean brood size (range)	3.2(2-5)	2.6(2-4)	2.5(2-4)
Productivity (cyg/paired ad.)	0.38	0.41	0.24
Single swans	1	1	7
Flocks	15	3	0
Total (ad/cyg)	66/19	68/26	42/10

1 Data from McKelvey et al. (1983).

2 ND = no data. Because of the timing of the 1985 survey birds were not found on nests.

severe recently in the Yellowstone area, and in 1984-85 at least 50 swans were known to have died as a result (R. Gale, Montana Cooperative Wildlife Research Unit, pers. com.).

The extensive forest fire of 1982 near Toobally Lakes did not appear to have directly affected any wetlands. Many of the surrounding areas show signs of past burns, so forest fires are not uncommon on Trumpeter Swan breeding range in that area. But the 1982 fire was exceptionally large, and in places very hot. The fire itself may have caused a direct mortality, from which the local population has not yet recovered, or it could have displaced the population to other areas such as the Northwest Territories (many more swans were found near Nahanni National Park Reserve than were expected--K.McCormick, C.W.S. Yellowknife, pers. comm). However, because Trumpeter Swans seem to be slow to colonize new areas, the return of those displaced birds to the Toobally Lakes area in subsequent years would have been expected. Either there was a mortality caused by the fire, or the fire had some affect on the wetland habitat that could not be detected during this survey, which has made the habitat less desirable.

One other possible reason for the apparent decline needs to be considered. Some swans were seen to be extremely secretive in parts of the survey, probably because they were molting, which might have caused some birds not to have been counted. However, such behaviour had not been observed in previous surveys. If, by chance, such behaviour had been missed in those surveys, similarly by chance that behaviour may have been more prevalent in the present survey. That seems improbable however, for two reasons. (1) It seems an unlikely behaviour to have missed by chance in previous surveys, given the frequency of those surveys between 1978 and 1981. (2) Surveys in the Northwest Territories, only one week later, found more swans than expected, with no evidence of any secretive behaviour (K. McCormick, pers. comm.).

British Columbia. The area surveyed in 1985 near Fort Nelson included a slightly larger area than was covered in 1981, however, within that area some lakes on which swans were seen in 1981 were not visited in 1985. Of the areas surveyed in both years, there were fewer pairs noted in 1985, but more young birds were seen. In 1981 no broods were found, while in 1985 3 broods with a total of 4 young were located. Table 5 compares the locations of the sightings in 1981 and 1985.

The Fort St. John region appears to be the only surveyed area that has shown an overall increase in swan numbers since 1981. There were some local changes though, with the Boudreau Lakes area having fewer pairs, but appearing to be more productive, than in the past. In 1981 3 pairs and one group of 4 birds were seen in the Boudreau Lakes, while in 1985 only 2 pairs were seen, but they had a total of 10 cygnets with them. Details of the locations of the sightings are given in Appendix 2.

Habitat Conditions

Yukon. Some local changes in habitat were noted but no major changes were seen, except for the large fire near Toobally Lakes. The following comments are necessarily subjective, because habitat observations were made only from aircraft. They follow generally the chronological course of the survey.

Water levels in the Teslin area were reported by the pilot (D. Denison) to be somewhat higher than normal, owing to an unusually wet spring and summer and an exceptionally heavy snowfall in 1984-85. The Nisultin River delta had no mud flats exposed and Teslin Lake was about one meter higher than normal for the time of year (D. Denison, Coyote Air Services, Teslin, pers. obs.). Marshes in the Nisultin River all showed very good growths of sedge (Carex sp.) and spikerush (Eleocharis sp.), and water in the marshes often extended

Table 5. Location of swan sightings in the Ft. Nelson area, 1981 and 1985

Location	Date 1981	1985
G5A (56 53 N x 120 55 W)	1p[1]	not surveyed
lakes east of mile 250-210	1p	not surveyed
E7A (58 24 N x 123 01 W)	1p	0
South of Klowee L. (58 32 N x 123 08 W)	8a	0
Klowee L.	2p	2a2j, 2a1j
Milo L.	1p	2a1j
Oxbow west of Jackfish/Prophet rivers	1	could not be located
A6	1p	not surveyed
Klua Lakes Central L.	1p, 3a	0
West L.	1p	1p
East L.	1p	1p
(58 03 N x 22 04 W) Bigfoot pond	1p	0
Tommy Lakes	0	0
Clark Lake area	0	1p (53 38 N x 122 31 W)
Evie Lake area	not surveyed	1p (58 58 N x 123 14 W)
Komie Lake	not surveyed	1p

1 p=pairs; a=adults; j=juveniles.

into the trees. The Hutsigola Lake area appeared unchanged from 1982, with no obvious signs of unusual water levels. Although a thorough search for beaver was not possible, signs of beaver in the Hutsigola area were infrequent. Perhaps, if there is a connection between beaver and Trumpeter Swans (see McKelvey et al. 1983), that would explain why so few swans were seen in what otherwise appeared to be suitable habitat. In the absence of a better understanding of water quality prefered by Trumpeter Swans however, that relationship remains hypothetical.

Water levels in the Sheldon Lakes/McEvoy Lake/McPherson Lake area did not seem to be abnormal. The McPherson Lake area seemed generally much more productive than areas seen nearer Ross River, as evidenced by aquatic plant growth and numbers of waterfowl. However, much of what appears to be potentially suitable habitat had no swans, and generally very few ducks.

As mentioned, the Toobally Lakes area was subjected to a very large forest fire in 1982. By and large it seems not to have directly affected any wetlands, but its actual affects on swan production are unknown. Water levels throughout the area were generally high in 1985, except in some special cases. The marsh at the south end of Barney Lake, which had supported swans in 1981, was much drier than in the past, and the beaver-created marsh on the southeast corner was completely dry. Water levels on some of the Turquoise Lakes north of Siwash Creek were lower, and some basins were almost empty. The Turquoise Lakes are apparently spring fed and their drying up may have been due to some change in the ground water regime. The fire may have caused changes in the run-off/seepage regime which in turn could have influenced the spring recharge area (M. Dennington, pers. comm.).

British Columbia. Water bodies in the Fort Nelson area did not show noticeable changes from the previous survey. Plant growth was very good on most areas, and near Clarke Lake appeared better than in 1981.

Habitat conditions on waterbodies in the Fort St. John area also seemed relatively unchanged. One exception was Boudreau Lake, which did not appear to have as much emergent plant growth as in 1981. The water was also very muddy looking; however, that could have been a result of brisk surface winds on the day of the survey. No swans were seen at Boudreau Lake in 1985 but a pair was present there in 1981. A small fire near Bearhole Lake earlier in 1985 was the only other noticeable habitat change in this part of the survey area.

CONCLUSIONS

During the intensive survey for Trumpeter Swans in British Columbia and the Yukon a total of 75 adult swans with 47 cygnets were recorded. Previous estimates (NATSMP) have placed the total nearer 130–150 (plus cygnets) for the region. That apparent decline, when the Alaska population is increasing so rapidly, is cause for concern. Although the reasons for the decline are somewhat speculative, recent high mortality on the Yellowstone National Park wintering area is the most likely cause. A more frequent monitoring of at least parts of the Toobally Lakes population seems warranted. Adequate wintering habitat may be critical for the future of this population.

ACKNOWLEDGEMENTS

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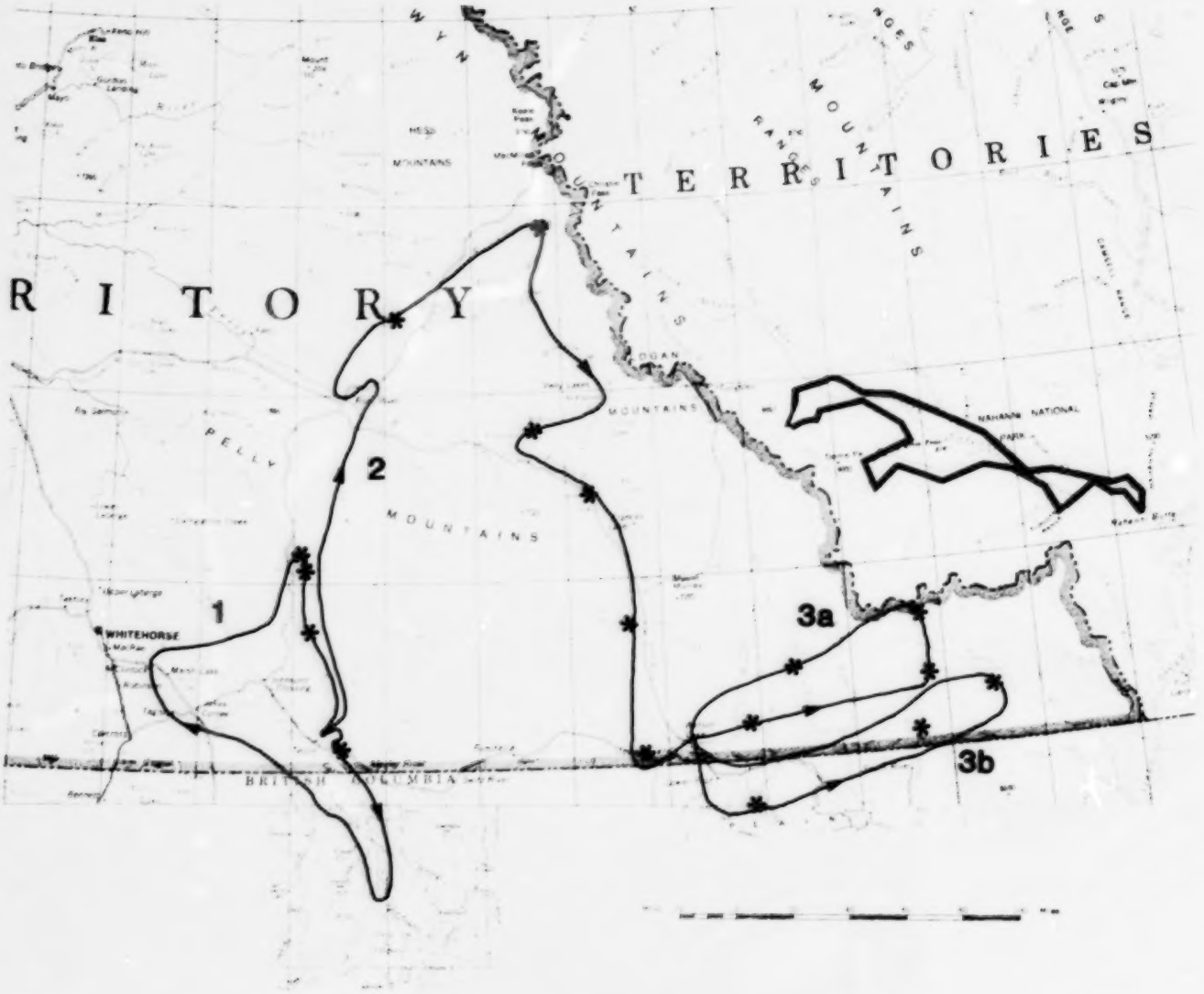
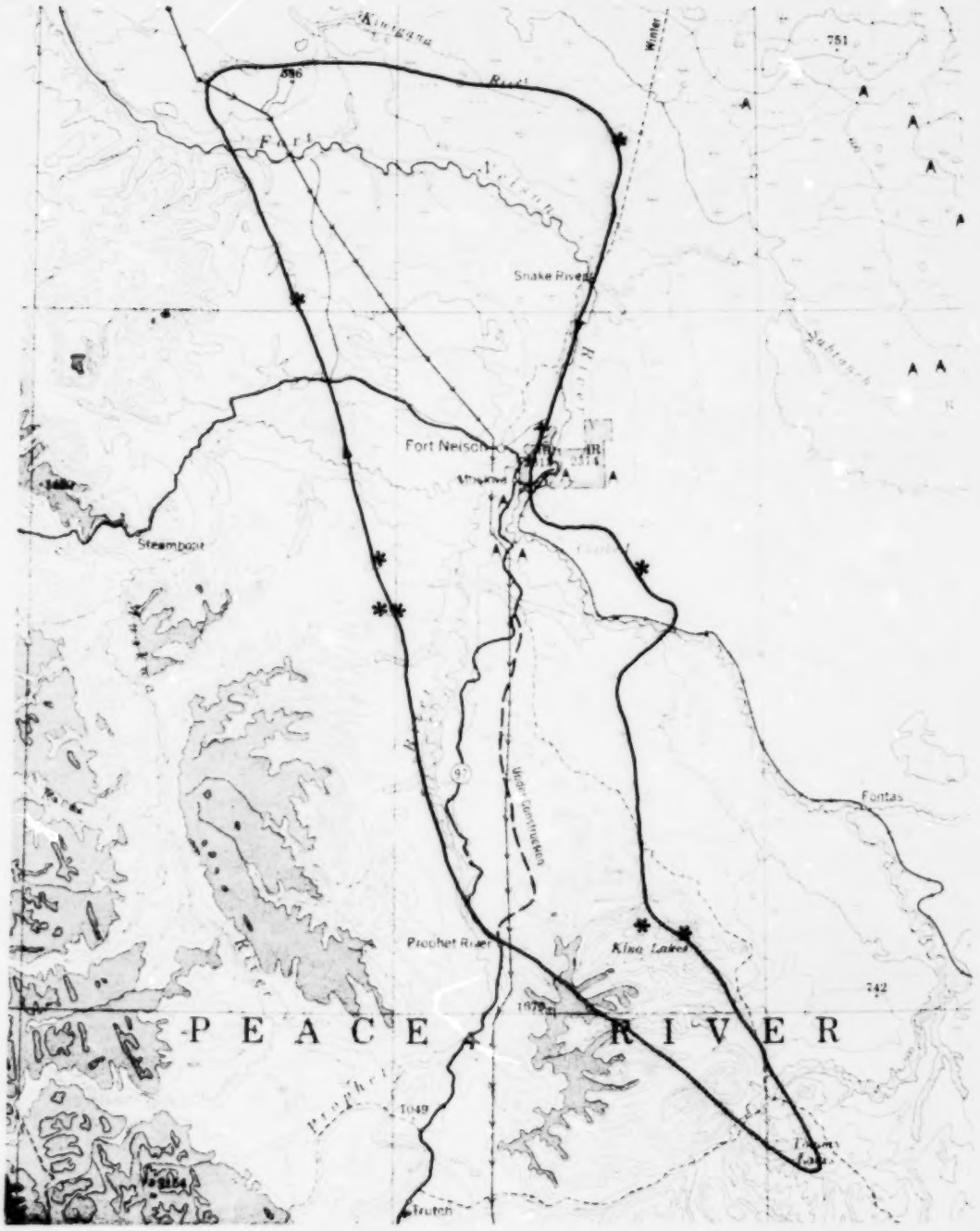
Appendix 1

Survey Route Maps

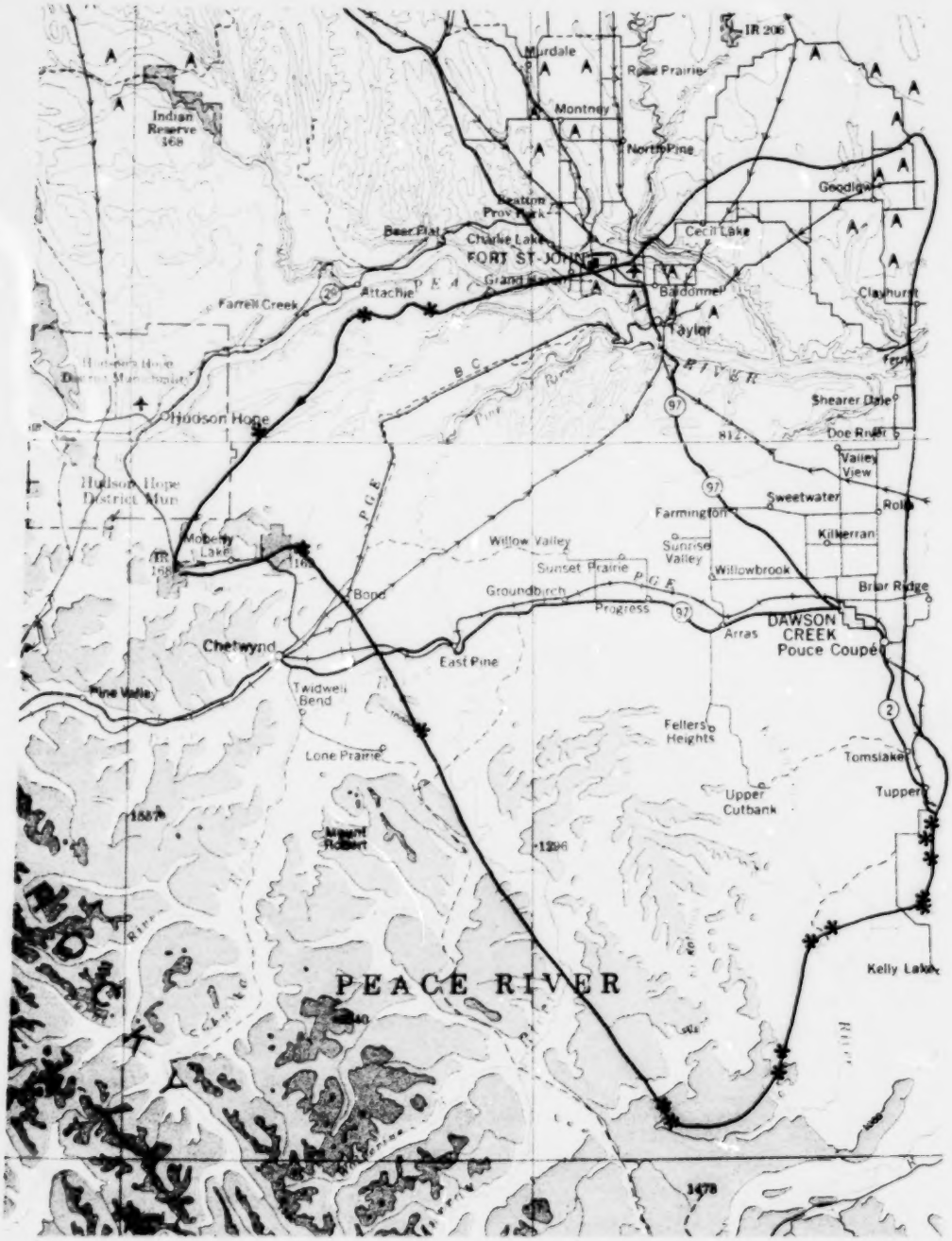


Swan survey route in the Yukon, 1985.
1 – 27 July 2 – 28 July 3a and 3b – 29 July
The general areas of observation are shown by *


Fort Nelson
Snake River
Steamboat
Fontas
Prophet River
Kiwa Lakes
PEACE RIVER
Kilometres 10 5 0 10 20 30 40 50 60 70 80 90 100 110 Kilometres
1 Millimetre = 1 Kilometre
1 Millimetre = 1 Kilometre
Statute miles 10 5 0 10 20 30 40 50 60 70 Miles terrestres
1 inch = 15.78 Statute miles
1 Pouce = 15.78 Miles terrestres

Swan survey route in the Ft. Nelson area, 3 August, 1985.

The general area of observations are noted by *



Swan survey route in the Ft. St.John area, 5 August, 1985.

The general area of observations are noted by *

Appendix 2

Details of each swan sighting

Table 2-1. Locations and descriptions of each swan sighting, 1985 Trumpeter Swan survey, Yukon.

Date and observation No.	Location	No. seen	Comments
27 July			
1.	60 30 N x 132 08 W	1a[1]	Small pond south of Eagle Bay.
2.	61 10 N x 132 16 W	1a	Creek inflow, southern part of Nisutlin L.; lone bird on water; good habitat nearby, no nest.
3.	61 10 N x 132 01 W	1a	Lone bird on shore of small lake east of Nisutlin L.; bird amongst willows, well concealed, reluctant to move.
4.	60 34 N x 132 42 W	2a	Thirty mile slough on Nisutlin R. Two birds not together; one in reeds (Scirpus?), did not move to open water; drowned nest nearby. Other bird in open water, different compartment of slough.
28 July			
1.	61 10 N x 132 11 W	1a	Bird #2 of 27/7 relocated.
2.	62 49 N x 130 17 W	1a	One bird on west end of Itsi L; by itself in open; no sign of other birds.
3.	62 49 N x 130 20 W	2a	Two molting on John L.; concealed in brush.
4.	61 46 N x 230 44 W	1a	One lone bird in beaver pond that has been drawn down.
5.	61 42 N x 130 25 W	2a	One pair on water.
6.	61 46 N x 130 22 W	2a	Pair molting near old nest; very secretive. Nest may have egg shells or feathers.
7.	61 57 N x 129 30 W	4a	4 adults on open water near river mouth; McPherson L.
8.	61 57 N x 129 30 W	2a2j	At river mouth, near nest in weeds; 3-4 weeks old.
9.	61 57 N x 129 30 W	1a	Alone in weeds near nest or perch.

1 a=adult; j=juvenile.

Table 2-1. continued

Date and No.	Location	No. seen	Comments
10.	61 09 N x 129 44 W	4a	2 pairs and signs of an old nest.
11.	61 04 N x 129 44 W	2a2j	Young - 4 weeks old.
12.	60 55 N x 129 43 W	2a	Alone, in open; Jimmy L.
13.	60 06 N x 129 12 W	2a4j	1st Dodo L.
July 29			
1.	60 08 N x 128 28 W	2a2j	Garden Cr.
2.	60 09 N x 126 55 W	2a2j	Lootz L., outlet
3.	60 10 N x 126 49 W	2a	Lootz L. system
4.	60 12 N x 126 47 W	2a	" system
5.	60 14 N x 126 46 W	2a	" system
6.	60 17 N x 126 42 W	2a	" system
7.	60 18 N x 126 19 W	1a, 1a	Interlake Marsh
8.	60 21 N x 126 14 W	1a,	above Toobally (Smith R. trib.)
9.	60 26 N x 126 10 W	2a	above Toobally
10.	60 26 N x 126 11 W	1a	N. Toobally
11.	60 40 N x 125 54 W	2a	Jackpine #1
12.	60 43 N x 125 47 W	2a2j	Jackpine #2
13.	60 46 N x 125 46 W	2a	Jackpine #5
14.	60 48 N x 125 47 W	2a	Jackpine #6
15.	60 49 N x 125 46 W	2a2j	Jackpine #8
16.	60 49 N x 126 03 W	2a	Jackpine #12
17.	60 34 N x 126 47 W	2a	North Quartz L.
18.	60 32 N x 126 57 W	2a	Quartz L.
19.	59 52 N x 126 44 W	2a2j	Egnell L.
20.	59 55 N x 126 47 W	2a	North Egnell L.
21.	59 57 N x 126 38 W	2a	
Tsia L.			
22.	59 43 N x 126 34 W	2a	Tsia L.
23.	59 54 N x 126 41 W	1a	Triangle L. #1
24.	59 56 N x 126 45 W	2a	Triangle L. #2
25.	60 02 n x 125 51 W	2a	Tropical Cr.
26.	60 07 N x 125 34 W	1a	Larsen L.
27.	60 08 n x 125 49 W	2a	Crow R. pond #2
28.	60 11 N x 125 51 W	2a	Crow R. pond #5
29.	60 12 N x 125 50 W	2a4j	Crow R. pond #6
30.	60 13 N x 125 49 W	2a	Crow R. pond #7
31.	60 16 N x 125 43 W	2a	Crow R. pond #12
32.	60 12 N x 126 08 W	1a	E. Toobally L.
33.	60 07 N x 106 40 W	2a	Siwash Cr.
34.	60 00 N x 126 39 W	2a	Triangle L.
July 22			
1.	62 16 N x 140 29 W	2a;2a2j	9mi NW of Snag
2.	61 57 N x 140 25 W	10a;2a	near Koidern potholes

Table 2-1 concluded

Date and No.	Location	No. seen	Comments
August 5			
1.	62 42 N x 135 37 W	1a	6 mi NE of Tatlemain
Sept. 3			
1.	61 55 N x 140 18 W	6a	White River area
2.	61 56 N x 140 20 W	4a	White River area
3.	62 04 N x 140 40 W	3a	White River area
Sept. 8			
1.	61 23 N x 138 53 W	1a	Kluane Lake
2.	61 27 N x 139 11 W	1a	Kluane Lake
Sept. 18			
1.	61 15 N x 129 58 W	2a;2a; 2a4j	near headwaters of Tuchitua R. (probably recorded in August survey. Not included in Table 3.)

Table 2-2. Summary of swan sightings and their locations, 1985 Trumpeter Swan survey, Fort Nelson area.

Date and No.	Location	No. seen	Comments
August 3			
1.	58 38 N x 122 31 W	2a	In Clark L. area
2.	58 07 N x 122 23 W	2a	Marsh in west end Klua L., same area as 1981 survey.
3.	58 04 N x 122 08 W	2a	In sedge meadow, SE Klua L.
4.	58 33 N x 123 00	2a2j,2a1j	Klowe L.; one pair each end of lake.
5.	58 38 N x 123 02 W	2a1j	Milo L.
6.	58 58 N x 123 14 W	2a	NW of Evie L., near newly cleared farm land.
7.	59 12 N x 122 00 W	2a	Komie L.

Table 2-3. Summary of swan sightings and their locations, 1985 Trumpeter Swan survey, Fort St. John area.

Date and No.	Location	No. seen	Comments
1.	56 06 N x 121 03 W	2a6j	Beaver pond near Worth
2.	56 11 N x 121 26 W	2a	Pond #4, Boudreau Lks. area
3.	56 09 N x 121 26 W	2a1j	Pond #5, Boudreau Lks. area
4.	56 07 N x 121 28 W	1a	Pond #7, Boudreau Lks. area
5.	55 58 N x 121 46 W	2a4j	Rene L.; on island
6.	55 53 N x 121 25 W	2a	Narrow L.; near beaver lodge at outflow
7.	55 21 N x 120 47W	2a	Muskeg L.; good plant growth
8.	55 03 N x 120 40 W	2a	Bearhole L.; brood reported before fire.
9.	55 03 N x 120 35 W	2a	East Bearhole L.
10.	55 05 N x 120 27 W	2a	South Blackhawk L.
11.	55 07 N x 120 26 W	2a3j	Blackhawk L.
12.	55 11 N x 120 20 W	2a	Tent Is.; in beaver workings.
13.	55 16 N x 120 23 W	2a	Between Lockhorn L. and One Is. L.
14.	55 19 N x 120 06 W	2a	Cutbank L. Lake drawn down.
15.	55 19 N x 120 06 W	8a	Cutbank L. Lake drawn down.
16.	55 21 N x 120 03 W	1a	Beaverlodge L.; in SW corner.
17.	55 23 N x 120 05 W	2a3j	Teepee L.; east end
18.	55 17 N x 120 07 W	2a3j	Twin L.; east end
19.	55 16 N x 120 03 W	1a	Gautier L.
20.	55 18 N x 120 03 W	1a	Foster L.
21.	55 19 N x 120 02 W	2a	pond in lot 412.

Table 2-4. Summary of other swan sightings and their locations, 1985 British Columbia Trumpeter Swan Survey.

Date and No.	Location	No. seen	Comments
Summer 1985	54 31 N x 126 24 W	2a in spring 1a in August	Old Man lake
July 31			
1.	59 31 N x 137 26 W	2a	Alsek River
2.	59 27 N x 137 37 W	2a	Alsek River
3.	59 29 N x 137 44 W	1a4j	Alsek River

Appendix 3. Table 4 reconstructed to include all data collected in 1985 from the greater Toobally Lakes area.

	Date 1985
Pairs	27
Nests	ND
Broods	5
Brood size (range)	2.3 (2-4)
Productivity (cyg/pair)	0.22
Single swans	7
Flocks	0
Total (ad/cyg)	61/12